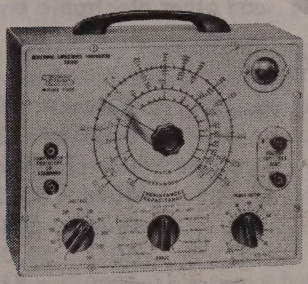
INSTRUCTION MANUAL FOR

Model 950B



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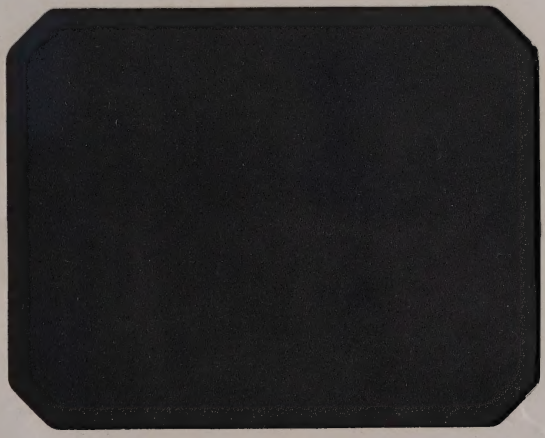
EICO ELECTRONIC INSTRUMENT CO., Inc.

283 MALTA STREET, BROOKLYN, N. Y. 11207



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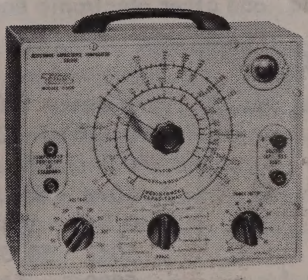
Laboratory Precision at lowest cost

INSTRUCTION MANUAL

Model 950B



ELECTRONIC INSTRUMENT CO., Inc.

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general description

The Model 950-B is a highly flexible ac-powered bridge which measures capacitance in the range from 10 mmf to 5000 mf and resistance from 0.5 Ω to 500 MΩ on direct reading scales, employing an electron-ray ("magic eye") tube as a visual null indicator. Measurement of resistance, capacitance, and inductance by comparison with an external complementary standard is also possible, in which case a special ratio scale is read. An invaluable feature for service work is a dual-sensitivity leakage test employing a built-in source of polarizing voltage, continuously variable from 0 to 500 volts dc. The high sensitivity leakage test is used for testing paper, mica, and ceramic capacitors and the low sensitivity test for electrolytic capacitors. The electron-ray tube is the leakage indicator in both tests. In addition, this instrument provides direct power factor measurement on the higher capacity ranges in which electrolytics are measured. The Model 950-B, by the nature and accuracy of its testing and measurement facilities, will be found extremely valuable in the servicing of TV, fm-am radio, and other electronic equipment.

specifications

Capacity: 4 ranges	10 mmf - 5000 mmf
	0.001 mf - 0.5 mf
	0.1 mf - 50 mf
	50 mf - 5000 mf
Resistance: 4 ranges	0.5 Ω - 500 Ω
	50 Ω - 50,000 Ω
	5000 Ω - 5 MΩ
	5 MΩ - 500 MΩ
Comparator: 1 range	ratio from 0.05 to 20 (400 to 1)
DC Polarizing Voltage: (for leakage test)	0-500 volts continuously variable
Power Factor: 1 range	0-80%
Tube Complement:	1-1629, 1-6X5
Power Supply:	transformer operated half-wave rect.
Power Requirements:	105-125 volts AC, 50/60 cps
Overall Dimensions:	8" high, 10" wide, 4 3/4" deep
Weight:	10 lbs.

operation

PRELIMINARY: Plug the line cord into an ac outlet supplying 105-125 volts, 50/60 cps. Rotate the POWER FACTOR control clockwise from the "AC-OFF" position. Allow a 1-minute warm-up period, during which the electron-ray tube will slowly attain its characteristic green glow.

CONNECTIONS: The component to be measured or tested, whether it be

resistive, capacitive, or inductive, is always connected to the right-hand binding post. In the case of electrolytic capacitors, the positive lead must go to the plus binding post and the negative lead to the minus binding post. In comparison measurement, the standard component is connected to the left-hand binding posts, and, as usual, the unknown component is connected to the right-hand binding posts. If the component to be measured is connected in a circuit, it will be necessary to disconnect at least one side from the circuit so that the measurement will not be affected by other circuit components. To measure an extremely small capacitor, it will be necessary to remove it from the circuit entirely and connect it directly across the binding posts.

READING COMPONENT VALUES: In all component value measurements, whether made on the direct reading resistive and capacitive ranges or on the comparator range, the reading is made by setting the RANGE switch to the range including the expected value (comparator has only one range) and rotating the pointer knob to the point on the dial at which the bridge is balanced.

Balance is indicated as follows: When the bridge is far from balance, the entire target area of the electron-ray tube glows green with even a narrow, extra-bright sector resulting from "overlapping". As the pointer knob approaches the balance point, first the "overlapping disappears and is replaced by a dark shadow sector. The closer the pointer knob approaches the balance point, the wider the shadow sector grows. If the balance point is passed the shadow sector will narrow down again. The position of the pointer knob at which the shadow angle is maximum is the balance point.

On the two highest capacitance ranges the power factor potentiometer is switched into the standard capacitor arm of the bridge to permit balancing of the internal series resistance frequently present in electrolytic capacitors. The "POWER FACTOR" knob must therefore be manipulated together with the pointer knob in order to achieve perfect bridge balance. The power factor control should be set at "0" while the pointer is rotated to obtain a capacitive balance. If the internal series resistance of the capacitor being measured is appreciable, the shadow angle at capacitive balance will be less than normal. When this occurs, the power factor control is rotated clockwise until the shadow angle reaches its normal maximum. The % power factor of the capacitor may be read on the power factor dial.

NOTE: Power factor is a measure of power dissipation in a capacitor due to its effective internal series resistance. In filter applications, power factor reduces the measured capacity as follows: At 20% p.f., C effective is 98% of C measured; at 30% p.f., C effective is 95% of C measured; at 50% p.f., C effective is 87% of C measured.

If the unknown capacitance or resistance is smaller than the minimum of the

range used, either balance will be obtained in the off-scale sector counter-clockwise from the lowest value marked on the dial or the shadow angle will widen to maximum only as the pointer knob approaches maximum counter-clockwise rotation (except on the expanded ranges). If the unknown capacitor is open or if the unknown resistor is shorted, the last-mentioned indication will be obtained even when the RANGE switch is set at the lowest capacitance or resistance range.

If the unknown resistance or capacitance is larger than the maximum of the range used, either balance will be obtained in the off-scale sector clockwise from the largest value marked on the dial or the shadow angle will widen to maximum only as the pointer knob approaches maximum clockwise rotation. If the unknown capacitor is shorted or if the unknown resistor is open, the last-mentioned indication will be obtained even when the RANGE switch is set at the highest capacitance or resistance range.

NOTE: To obtain the correct value of extremely small capacitors, the value of the distributed wiring capacity for your particular instrument should be subtracted from the reading obtained. This compensation is required in practically all instruments of this type. To measure the distributed wiring capacity, set the RANGE switch at the lowest capacity range ("10 mmfd - 5000 mmfd") and adjust the pointer knob carefully for exact bridge balance with nothing connected to the instrument terminals. You will have to observe the electron-ray tube very closely to determine just where the maximum shadow angle occurs. If the distributed wiring capacity readings is less than 10 mmf (off-scale) it can be safely ignored and no compensation need be made.

Interpretation of the reading on the ratio scale when the instrument is used as a comparator bridge depends upon the type of components being compared. When inductances or resistances are being compared, divide the known value of the standard by the reading on the ratio dial to obtain the value of the unknown. When capacitances are being compared, multiply the known value of the standard by the reading on the ratio dial to obtain the value of the unknown. It is unnecessary to use the comparator range for measurement of resistances and capacitances falling into the direct measurement range of the instrument. However, for resistances and capacitors outside the direct measurement range and for certain chokes, transformers, speakers, and coils, the comparator method of measurement is very useful.

LEAKAGE TESTS

To test for leakage in paper, mica, or ceramic capacitors, set the RANGE switch at the "PAPER-MICA TEST" position. To test for leakage in electrolytic capacitors set the RANGE switch at the "ELECTROLYTIC TEST" position. In

both tests, start with the "VOLTAGE" control at "0". The capacitor in both tests is connected across the right-hand binding posts just as in capacitance measurements. Be certain that the positive lead of an electrolytic capacitor is connected to the binding post marked plus and the negative lead to the binding post marked minus. Otherwise, not only will the leakage test have no value, but the electrolytic may be seriously damaged. Observe the electron-ray tube and note that the shadow angle is at maximum, which is the "normal" or "no-leakage" indication in the leakage tests. Now turn the "VOLTAGE" control from "0" to the rated dc working voltage of the capacitor. The shadow angle should contract instantaneously as the capacitor charges and then slowly expand. If the shadow angle completely disappears and does not reappear, the capacitor is excessively leaky. The shadow angle need not expand to the maximum as before in order for the capacitor to check good. As these tests are very sensitive, a little leakage in capacitors with values above .1 mfd may result in only a small shadow angle reappearing. This is normal with a good capacitor and the reappearance of even a very small shadow angle means that the capacitor is good. Only complete failure of the shadow angle to reappear indicate an excessively leaky capacitor. CAUTION: Discharge the capacitor before disconnection from the instrument terminals by turning the "VOLTAGE" control down to "0".

Note on Leakage Testing of Electrolytic Capacitors: Initial leakage current in an electrolytic capacitor is a function of shelf life; it does not show the condition of the capacitor. When making the leakage test, enough time must be allowed for the leakage current to reach the normal value. The instructions of the capacitor manufacturers are to measure the leakage current of the capacitor at the rated dc voltage, after the rated dc voltage has been applied to the capacitor for five minutes plus one minute for each month of shelf storage.

circuit description

The operation of the Model 950-B may be best understood by examining the circuit formed at each position of the range switch. In each of the bridge circuits P1 varies the resistance in two arms. Capacitor C5 or C6, resistor R10, and the electron-ray tube V2 compose the null indicating circuit. The 54 volt winding is the secondary winding of the power transformer that supplys the ac power to operate the bridge. R1 is a current limiting resistor.

The B plus voltage required to power the electron-ray indicator and the negative dc voltage required for leakage testing of capacitors are obtained from the 6X5 tube (V1) connected as a half-wave rectifier, in conjunction with the high voltage secondary winding of the power transformer and the filter and voltage divider networks composed of R8, R7, P3, C1 and C9.

NOTE: The electron-ray indicator is preferable to headphone or a meter since

it may be used without disturbance from external noises and is capable of withstanding substantial overloading without damage.

Simplified schematic diagrams of the Model 950-B circuit at each position of the range switch are given below.

Fig. 1. Bridge circuit for "10 mmfd - 5000 mmfd" range (C2) and ".001 mfd-.5 mfd" range (C3).

Fig. 2. Bridge circuit for ".1mfd - 50 mfd" range. P2 is required to balance the internal series resistance frequently present in electrolytic capacitors and is calibrated in % power factor.

Fig. 3. Bridge circuit for "50 mfd - 5000 mfd" EXPanded range. R2 expands capacitance measurement range as compared to circuit of Fig. 2.

Fig. 4. Bridge circuit for ".5Ω - 500Ω" range (R4), "50Ω - 50,000Ω" range (R5), and "5000Ω - 5MΩ" range (R6).

Fig. 5. Bridge circuit for "5MΩ - 500MΩ" EXPanded range. R2 expands resistance measurement range as compared to circuit of Fig. 4.

Fig. 6. Bridge circuit for "COMPARATOR" range.

Fig. 7. Leakage check circuit in "PAPER-MICA TEST" position. R9 slows down charging process so that electron-ray tube action will not be too fast for detection by the operator.

Fig. 8. Leakage check circuit in "ELECTROLYTIC TEST" position. Note that R11, 2.2 KΩ, provides reduced electron-ray tube sensitivity as compared to the circuit of Fig. 7.

replacement parts list

Stock#	Sym.	Description	Am't.	Stock#	Sym.	Description	Am't.
23006	C1	cap., elec 8 mfd-525 V..	1	11002	R4	res., 20Ω, 1/2W, 1%.	1
21500	C2	cap., 200 mmf, prec. ..	1	11011	R5	res., 2KΩ, 1/2W, 1%.	1
20500	C3	cap., .02 mf, prec. ..	1	11026	R6	res., 200KΩ, 1/2W, 1%.	1
20501	C4	cap., 2 mf, prec.	1	10803	R7	res., 3.3KΩ, 1W ...	1
20000	C5,6,7	cap., .01 mf, 400 V ...	3	10848	R8	res., 68KΩ, 1W	1
20015	C8	cap., .25 mf-600 V ...	1	10027	R9	res., 270KΩ, 1/2W ...	1
23008	C9	cap., elec 4 mfd-250 V..	1	10037	R10	res., 10MΩ, 1/2W ...	1
17000	P1	pot., 10KΩ	1	10818	R11	res., 2.2KΩ, 1W	1
18007	P2	pot., 1KΩ w/SPST	1	10028	R12	res., 470K, 1/2W ...	1
19005	P3	pot., 100KΩ, 4W	1	60030	S1	switch, range	1
10752	R1	res., 500Ω, 4W	1	30005	PT1	transformer, power ...	1
11027	R2	res., 250K, 1/2W, 1%.	1	90009	V1	tube, 6X5	1
10030	R3	res., 1MΩ, 1/2W,....	1	90015	V2	tube, 1629	1

NOTE: If your instrument fails to function properly and the cause of trouble is not apparent, you may reutrn it to the EICO repair department where it will be repaired at a charge of $3.50 plus the cost of parts. If possible, ship by Railway Express. Return shipment will be made express collect.

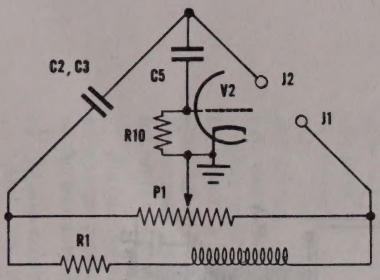


Fig. 1

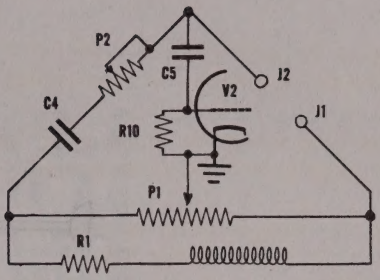


Fig. 2

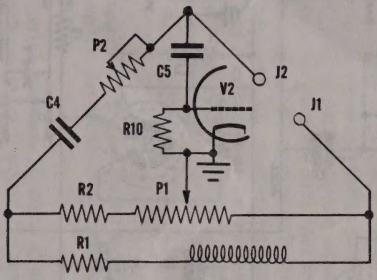


Fig. 3

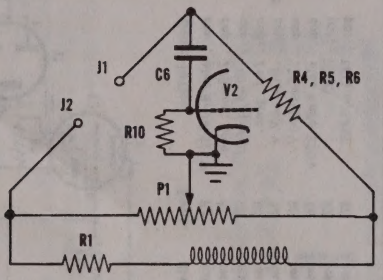


Fig. 4

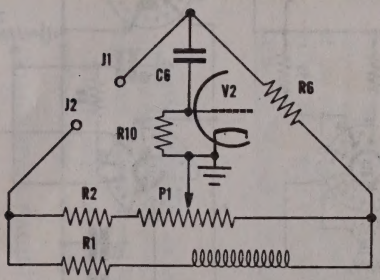


Fig. 5

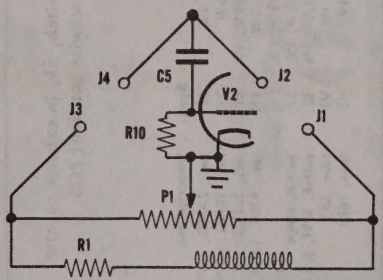


Fig. 6

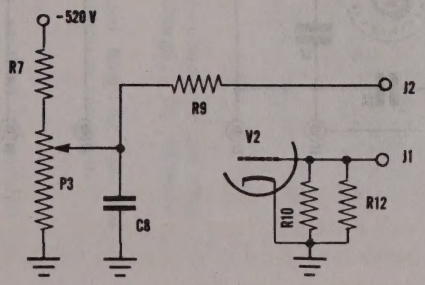


Fig. 7

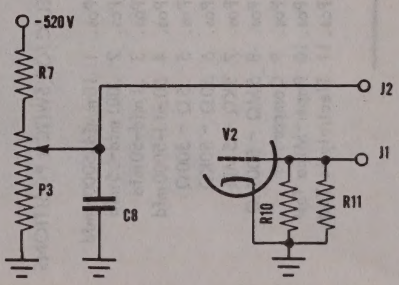
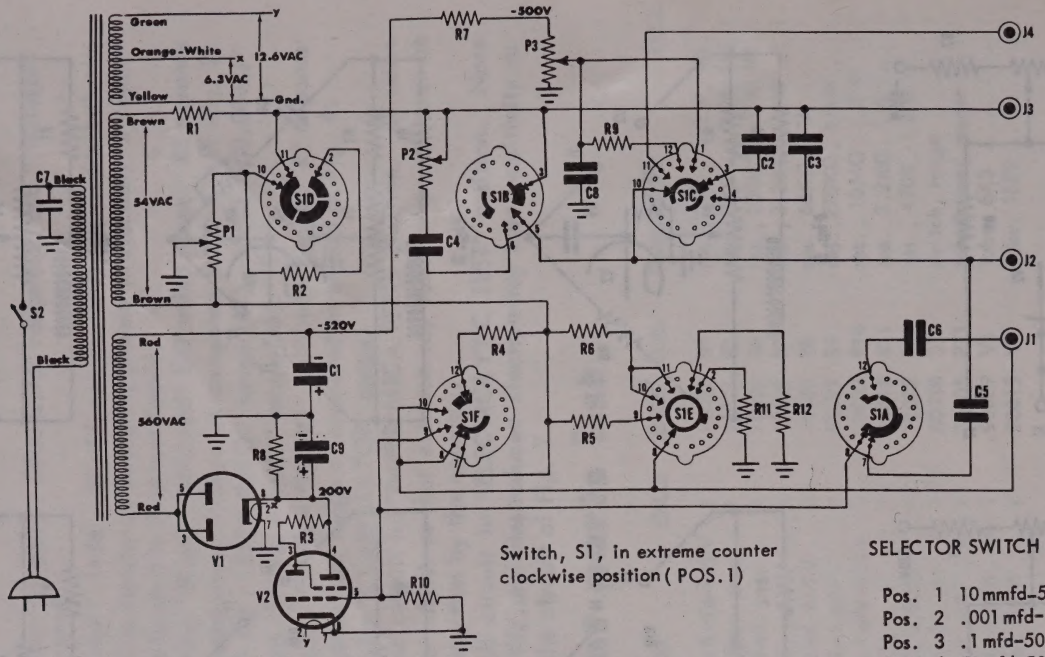


Fig. 8



Switch, S1, in extreme counter clockwise position (POS.1)

SELECTOR SWITCH POSITIONS

Pos. 1 10 mmfd–5000 mmfd
Pos. 2 .001 mfd–.5 mfd
Pos. 3 .1 mfd–50 mfd
Pos. 4 50 mfd–5000 mfd
Pos. 5 .5Ω – 500Ω
Pos. 6 50Ω – 50KΩ
Pos. 7 5KΩ – 5MΩ
Pos. 8 5MΩ – 500MΩ
Pos. 9 Comparator
Pos. 10 Paper-Mica Test
Pos. 11 Electrolytic Test

Sym.	Description	Sym.	Description	Sym.	Description
C1	cap., elec 8 mfd–525 V	P3	pot., 100KΩ, 4W	R9	res., 270KΩ, 1/2 W
C2	cap., 200 mmf, prec.	R1	res., 500Ω, 4W	R10	res., 10MΩ, 1/2 W
C3	cap., .02 mf, prec.	R2	res., 250K, 1/2 W, 1%	R11	res., 2.2KΩ, 1W
C4	cap., 2 mf, prec.	R3	res., 1MΩ, 1/2 W	R12	res., 470K, 1/2 W
C5,6,7	cap., .01 mf–400 V	R4	res., 20Ω, 1/2 W, 1%		
C8	cap., .25 mf–600 V	R5	res., 2KΩ, 1/2 W, 1%	S1	switch, range
C9	cap., elec 4 mfd–250 V	R6	res., 200KΩ, 1/2W, 1%	S2	switch, SPST, p/o P2
P1	pot., 10KΩ	R7	res., 3.3KΩ, 1W	V1	tube, 6X5
P2	pot., 1KΩ w/SPST	R8	res., 68KΩ, 1W	V2	tube, 1629

MODEL 950B
RESISTANCE-CAPACITANCE-COMPARATOR BRIDGE

EICO

on the parts list. If the part is not listed (or itself) in the parts list, it means that the part is integral with a sub-assembly, which we consider replaceable only as an entity. Parts integral with a sub-assembly may be listed in the parts list, so identified, if we consider that some or all of the parts may be individually replaced in the field under appropriate circumstances. If your unit is out of warranty, you are generally advised to order a replacement sub-assembly.

c) Describe as completely as possible the nature of the defect, or reason for requiring replacement.

REPAIR SERVICE

EICO maintains a national network of authorized service agencies, in addition to repair facilities at the factory, for in-warranty or out-of-warranty repair of EICO equipment. It is intended to serve those customers who are not sufficiently familiar with electronics to make use of the EICO Service Consultation facilities, or whose difficulties cannot be solved by correspondence.

For all out-of-warranty units repaired at the factory there is a minimum labor and handling fee. Charges for parts replaced are additional to the minimum fee.

For in-warranty completed kit units repaired at the factory there is a minimum labor and handling fee. There is no charge for a replaced defective part provided that the terms and conditions of the warranty for no charge replacement are not violated in the judgement of EICO.

For in-warranty factory-wired units, there is no charge for labor or parts if the unit complies with the terms and conditions of the warranty in the judgement of EICO. However, if the terms and conditions of the warranty are violated there will be a charge for labor plus parts.

unit to them for repair. Use of a local service station will often result in faster service, and, usually, lower transportation costs.

It is necessary that you comply with the Shipping Instructions that follow when sending in a unit for service.

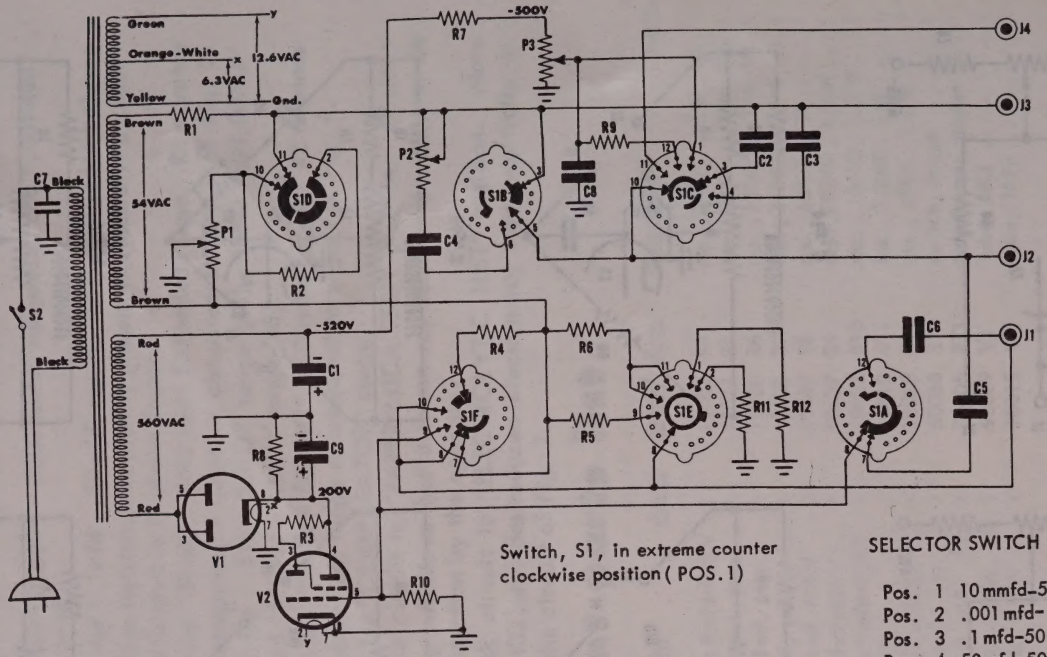
SHIPPING INSTRUCTIONS

You are strongly advised to retain the original shipping carton and inserts should reshipment be required for service or any other purpose. The carton may be collapsed for storage in as small a space as possible. In very many cases, the same carton is used for kit and factory-wired units so that the kit carton will serve for reshipment of the completed kit.

When sending a unit for service pack the unit very carefully, preferably in the original shipping carton with the original inserts. Be sure to place the bottom plate, cover, and supporting bracket, if any, on the unit before shipping.

If this is not possible, use a strong oversize carton, preferably wood, and using at least 3 inches of resilient packing material such as shredded paper or excelsior inserted between all sides of the unit and the carton. Seal the carton with strong gummed paper tape or strong twine or both. Attach a tag to the instrument on which is printed your name and address and brief reference to the trouble experienced. Affix "FRAGILE" or "HANDLE WITH CARE" labels to at least four sides of the carton or print these words large and clear with a bright color crayon. Ship prepaid.

Include your name and address on the outside of the carton. Return shipment will be made transportation charges collect. Note that a carrier cannot be held liable for damage in transit, if packing, IN HIS OPINION, is insufficient.



Switch, S1, in extreme counter clockwise position (POS.1)

SELECTOR SWITCH POSITIONS

Pos. 1	10 mmfd–5000 mmfd
Pos. 2	.001 mfd–.5 mfd
Pos. 3	.1 mfd–50 mfd
Pos. 4	50 mfd–5000 mfd
Pos. 5	.5 Ω – 500 Ω
Pos. 6	50 Ω – 50KΩ
Pos. 7	5KΩ – 5 MΩ
Pos. 8	5 MΩ – 500 MΩ
Pos. 9	Comparator
Pos. 10	Paper-Mica Test
Pos. 11	Electrolytic Test

Sym.	Description
C1	cap., elec 8 mfd–525 V
C2	cap., 200 mmf, prec.
C3	cap., .02 mf, prec.
C4	cap., 2 mf, prec.
C5,6,7	cap., .01 mf–400 V
C8	cap., .25 mf–600 V
C9	cap., elec 4 mfd–250 V
P1	pot., 10KΩ
P2	pot., 1KΩ w/SPST

Sym.	Description
P3	pot., 100KΩ, 4W
R1	res., 500 Ω, 4 W
R2	res., 250K, 1/2 W, 1%
R3	res., 1 MΩ, 1/2 W
R4	res., 20 Ω, 1/2 W, 1%
R5	res., 2KΩ, 1/2 W, 1%
R6	res., 200KΩ, 1/2W, 1%
R7	res., 3.3KΩ, 1W
R8	res., 68KΩ, 1W

Sym.	Description
R9	res., 270KΩ, 1/2 W
R10	res., 10 MΩ, 1/2 W
R11	res., 2.2KΩ, 1W
R12	res., 470K, 1/2 W
S1	switch, range
S2	switch, SPST, p/o P2
V1	tube, 6X5
V2	tube, 1629

MODEL 950B
RESISTANCE-CAPACITANCE-COMPARATOR BRIDGE

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Service Policy

PARTS REPLACEMENT

If it appears that a component is defective, and you desire a replacement, contact your EICO Distributor, the nearest EICO Authorized Service Agency or our Customer Service Department.

If you are claiming the right to a no-charge replacement under the terms and conditions of the warranty, it is required that you shall have sent in the registration card within 10 days of the date of purchase, and that you send back the defective part transportation prepaid. In claiming warranty service or parts, please send or show your original sales slip plus the IBM card from the carton. EICO or its authorized agency will make the necessary replacement at no charge for parts eligible under the terms and conditions of the warranty. In returning tubes, pack them very carefully to avoid breakage in shipment. Broken tubes will not be replaced. Please read the warranty on the subject of parts eligible for replacement.

Further information required on a part returned for a no-charge replacement under the terms and conditions of the warranty is as follows:

a) Model number and serial number, if any, of unit. Also any code numbers in red under the words INSTRUCTION MANUAL on the cover of the book supplied with the unit or Revision number, such as Rev. 1, Rev. 2, etc.

b) Stock number and description of part as given on the parts list. If the part is not listed (of itself) in the parts list, it means that the part is integral with a sub-assembly, which we consider replaceable only as an entity. Parts integral with a sub-assembly may be listed in the parts list, so identified, if we consider that some or all of the parts may be individually replaced in the field under appropriate circumstances. If your unit is out of warranty, you are generally advised to order a replacement sub-assembly.

c) Describe as completely as possible the nature of the defect, or reason for requiring replacement.

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For all out-of-warranty units repaired at the factory there is a minimum labor and handling fee. Charges for parts replaced are additional to the minimum fee.

For in-warranty completed kit units repaired at the factory there is a minimum labor and handling fee. There is no charge for a replaced defective part provided that the terms and conditions of the warranty for no charge replacement are not violated in the judgement of EICO.

For in-warranty factory-wired units, there is no charge for labor or parts if the unit complies with the terms and conditions of the warranty in the judgement of EICO. However, if the terms and conditions of the warranty are violated there will be a charge for labor plus parts.

In all cases, the unit must be sent to the factory or service agency transportation prepaid, and the unit will be returned to the customer transportation collect.

On kits, the services rendered for the minimum labor and handling fee by the factory are the correction of any minor wiring errors (not extensive corrections or rewiring), the labor involved in replacing defective parts, and any adjustments, alignment, or calibration procedures that would normally be performed on a factory-wired unit. Units not wired according to instructions, or modified in any way, or showing evidence of the use of acid core solder, will not be serviced and will be returned to the customer forthwith.

SEE SCHEDULE OF FACTORY SERVICE CHARGES

Units requiring extensive corrections or rewiring will incur an additional labor charge. An advance estimate will be submitted.

Please note: minimum labor and handling fees and service charges are subject to revision at any time.

LOCAL REPAIR FACILITIES

A list of authorized service stations is provided with your manual. The roster of stations may change from time to time, and if considerable time has elapsed since you purchased your unit, you are advised to contact the station you choose before sending the unit to them for repair. Use of a local service station will often result in faster service, and, usually, lower transportation costs.

It is necessary that you comply with the Shipping Instructions that follow when sending in a unit for service.

SHIPPING INSTRUCTIONS

You are strongly advised to retain the original shipping carton and inserts should reshipment be required for service or any other purpose. The carton may be collapsed for storage in as small a space as possible. In very many cases, the same carton is used for kit and factory-wired units so that the kit carton will serve for reshipment of the completed kit.

When sending a unit for service pack the unit very carefully, preferably in the original shipping carton with the original inserts. Be sure to place the bottom plate, cover, and supporting bracket, if any, on the unit before shipping.

If this is not possible, use a strong oversize carton, preferably wood, and using at least 3 inches of resilient packing material such as shredded paper or excelsior inserted between all sides of the unit and the carton. Seal the carton with strong gummed paper tape or strong twine or both. Attach a tag to the instrument on which is printed your name and address and brief reference to the trouble experienced. Affix "FRAGILE" or "HANDLE WITH CARE" labels to at least four sides of the carton or print these words large and clear with a bright color crayon. Ship prepaid.

Include your name and address on the outside of the carton. Return shipment will be made transportation charges collect. Note that a carrier cannot be held liable for damage in transit, if packing, IN HIS OPINION, is insufficient.

THE EICO WARRANTY

The Electronic Instrument Company, Inc., hereafter referred to as EICO, warrants that, for a period of 90 days from the date of purchase, any EICO kit will be free of defects in parts, and that any EICO factory-wired unit will be free of defects in parts and workmanship. For an EICO kit, EICO's obligation is limited to those parts which are returned transportation prepaid to the factory or authorized service agency without further damage, and in the judgement of EICO are either originally defective or have become defective in normal use. EICO's obligation does not include any labor required to locate trouble in or repair a kit. For an EICO factory-wired unit, EICO's obligation is limited to replacement or repair, at EICO's option, of those parts, sections, or entire units returned transportation prepaid to the factory or authorized service agency without further damage, and in the judgement of EICO are either originally defective or have become defective in normal use.

The warranty does not apply to any parts damaged in the course of handling, assembling, or wiring by the customer, or damaged due to abnormal usage or in violation of instructions or reasonable practice, or further damaged to a consequential degree in return shipment. Furthermore, the foregoing warranty is made only to the original customer, and is and shall be in lieu of all other warranties, whether expressed or implied, and of all other obligations or liabilities on the part of EICO, and in no event shall EICO be liable for any anticipated profits, consequential damages, loss of time, or other losses incurred by the customer in connection with the purchase or operation of EICO products or components thereof.

The registration card, which accompanies each EICO kit or factory-wired unit, must be filled in and returned to the company within 10 days after the date of purchase. This warranty applies only to registered units.

SCHEDULE OF FACTORY SERVICE CHARGES

(Consult your local EICO authorized service agency for THEIR charges.)

THESE CHARGES SUPERCEDE CHARGES WHICH MAY BE INDICATED IN YOUR MANUAL OR PREVIOUS SCHEDULES.

1. Same prices for wired units or completed kits.
2. Charges are based on the schedule of minimum charges above.
3. All labor charges are calculated at $7.50 per hour. For example, if the minimum labor and handling fee is $15.00, this covers up to 2 hours. Any labor time (in this example only) required over 2 hours is charged for at $7.50 per hour.
4. Above prices are for labor only. Parts are additional.
5. ESTIMATES: An estimate for repairs will be given before repairs are made where repairs will exceed stated minimum charges. If you choose not to have your unit repaired, a charge of $4.00 for estimating time will be made.
6. All prices are subject to change without notice.

IE 1371-358

MINIMUM LABOR AND HANDLING FEES

CRA & CRU	$ 3.50
Probes	3.50
AF4	11.50
RA6	7.50
HF12	11.50
HF14	7.50
HF20	15.00
HF22	7.50
HF30	7.50
HF32	14.50
HF35	7.50
ST40	22.50
HF50	7.50
HF52	15.00
HF60	7.50
HF61	9.00
HF61A	9.00
HF65	10.00
HF65A	10.00
ST70	22.50
HF81	20.50
ST84	15.00
HF85	12.00
HF86	13.50
HF87	13.50
HF89	13.50
HFT90	11.50
HFT92	13.50
HFT94	11.50
ST96	20.50
ST97	20.50
MX99	11.50
RP100	45.00
Playback Amp only	11.50
Power Supply only	11.50
Record Amp only	11.50
Head Alignment only	15.00
145	7.50
145A	7.50
147	7.50
214	9.00
221	9.00
222	10.50
232	9.00
235	10.50
249	9.00
250	10.50
255	10.50
260/261	10.50
315	9.00
320	7.50
322	7.50
324	7.50
342	22.50
352	7.50
360	7.50
368	19.00
369	19.00
377	9.00
378	10.50
380	24.00
425	9.00
427	19.00
430	19.00
435	22.50
460	22.50
470	22.50
488	$ 7.50
495	7.50
526	7.50
536	7.50
540	7.50
555	7.50
556	7.50
565	7.50
566	7.50
567	7.50
584	7.50
610	7.50
612	7.50
615	7.50
625	9.00
628	10.50
630	7.50
632	10.50
636	7.50
666	15.00
667	15.00
680	9.00
706	7.50
710	7.50
711	10.50
712	15.00
715	7.50
717	11.50
720	20.50
722	13.50
723	15.00
730	15.00
740	13.50
751	16.50
752	16.50
753	37.50
760	13.50
761	13.50
762	13.50
770	18.00
771-2	18.00
777	30.00
779, A	25.50
791	7.50
803	7.50
888	9.00
902	37.50
944	7.50
950	7.50
955	9.00
965	22.50
1020	7.50
1030	15.00
1040	11.50
1050	7.50
1055	7.50
1060	7.50
1064	9.00
1073	7.50
1078	7.50
1100	7.50
1120	7.50
1140	7.50
1171	7.50
1180	7.50
2036	20.50
2050	20.50
2080	20.50
2200	15.00
2400	30.00
2510	18.00
2536	26.50
2715/16	15.00
3070	18.00
3200	18.00
3566	37.50
3570	39.50
4000	30.00
7923	28.50

EICO ELECTRONIC INSTRUMENT CO., INC.
283 Malta St., Brooklyn, N.Y. 11207

AUTHORIZED WARRANTY SERVICE AGENCIES

ALABAMA

Birmingham
Nelco Service Co.
2900 - 4th Ave. S.

Mobile
Universal Electronics & Instr. Svce.
3058 Brookline Dr. W.

Montgomery
Audio Service Center
319 Fleming Rd.
(Hi-Fi Only)

G & T Electronics
18 Davis Dr.
(CB Only)

ARIZONA

Phoenix
ABC-2-Way Radio Comm.
1844 E. Indian School Rd.
(CB Only)

Tucson
Park Music Shop
1702 E. Speedway

CALIFORNIA

Anaheim
United Sound & TV Co.
2010 W. Lincoln Ave.

Barstow
Roy's Communications Svce.
615 E. Main St.

Los Angeles
Electronic Instruments Service
8921 S. Vermont Ave.

United Sound & TV Co.
5036 Venice Blvd.

Orange
Electro Tech Svce. Co.
417 S. Main St.

San Diego
Lewton's Radio & TV
4251 University Ave.
(High Fidelity Only)

San Francisco
California Sound Engineers
475 Barneveld Ave.
(Hi-Fi, CB & Ham Only)

Guaranteed Electronics Repair
5822 Mission St.

COLORADO

Colorado Springs
Clyde N. Still
2630 W. Kiowa St.

Denver
A. B. & K. Service, Inc.
1459 South Pearl St.

CONNECTICUT

Groton
Francis Electronics, Inc.
565 Long Hill Rd.

CONNECTICUT (cont'd)

Hartford
Herbert Electronics
1081 Capitol Ave.

New Haven
Baltimore Electronics
546 Whalley Ave.
(Hi-Fi Only)

Norwich
La Course Radio-Electric Svce.
184 Franklin St.

DISTRICT OF COLUMBIA

Bethesda
American Technical Services
4925 Bethesda Ave.

FLORIDA

Miami
Spire Audio-Visual Co.
24 N. W. 36th St.

North Miami Beach
Southeastern Communications, Inc.
2055 N.E. 151st St.

Orlando
Electronics Service Labs.
1024 N. Mills

Tampa
Maurice Wood
1949 W. Buffalo

Sylvania Service Center
1602 Florida Ave.

GEORGIA

Atlanta
S. A. Sparks Communication Svce.
1052 Memorial Drive S. E.

IDAHO

Twin Falls
TV Tuner Service
P. O. Box 793

ILLINOIS

Chicago
Banks Electronics
5107 W. Division St.

Electronic Engineers, Inc.
1639 W. Evergreen (1300 N.)

Oak Park
B. & S. Electronics
6326 W. Roosevelt Rd.

Peoria Heights
Put's Radio-Sales
737 E. Marietta
(CB Only)

IOWA

Cedar Rapids
Gene's Radio & TV
503-8th Ave. S. E.

Sioux City
Mar-Bon, Inc.
Route 2, Box 138
(CB & Ham Only)

KENTUCKY

Louisville
Maury's Fluorescent & Appl. Svce.
962 South 3rd St.

A & T Two-Way Radio
2339 Rockford Lane
(CB Only)

LOUISIANA

New Orleans
Transistor Electronics Svce. Co.
Room 5, Bldg. 17
Foreign Trade Zone
Foot of Napoleon Ave.
(Phone: 899-9505)

Shreveport
Audio & Instrument Assoc.
5511 Sussex Street

MAINE

Portland
Bartlett Radio Co.
181 Brackett St.

MARYLAND

Baltimore
Clayton Electronics, Inc.
5940 York Rd.

Bethesda
American Technical Services
4925 Bethesda Avenue

MASSACHUSETTS

Boston
Park Armature Co.
1218-30 Columbus Ave.

Worcester
Audio-Visual Associates
8 Boylston St.

MICHIGAN

East Detroit
Sealand Electronics, Inc.
23043 Gratiot

Lincoln Park
Lincoln Park Sound Svce.
2884 Fort Street

THIS LIST IS SUBJECT TO CHANGE WITHOUT NOTICE /continued on reverse side/

MISSOURI

St. Louis

Scherrer Instruments
5449 Delmar Blvd.

A. A. Kelley Radio & Elect. Svce.
4181 Manchester

NEBRASKA

Lincoln

Electronics Associates
2238 "O" St.

Omaha

Hi-Pix Stereo Service
3427 S. 42nd St.

NEW HAMPSHIRE

Manchester

Roland Demers Svce. Co.
436 Maple St.

Wholesale Electronics Corp.
40 Bridge St.

NEW JERSEY

Riverside

Dixey-Bonas TV
52 Scott St.

Singac

Hosica Laboratories
715 Main St.

NEW MEXICO

Albuquerque

The Audio Clinic
1510 Eubank Blvd., N. E.

NEW YORK

Albany

Baker Electronics
514 Second St.

Binghamton

Ross' Radio & TV Service
116 Main St.

Hastings on the Hudson
(Westchester County)

Central TV & HI-FI Service
543 Warburton Ave.

Huntington Station

Suffolk Sound Repair, Inc.
1671 New York Ave.
(Hi-Fi & Test Fqpt. Only)

Mineola

Ethical Electronic Service
468 Jericho Turnpike

NEW YORK CITY

Manhattan

Winters' Radio Laboratory
11 Warren St.

Brooklyn

G. M. T. V.
252 Prospect Park West

Queens

Electronic Servicenter
65-37 Queens Blvd.
Woodside

Great Northern Tronics, Inc.
145-04 Jamaica Ave.

NEW YORK CITY (cont'd)

Syracuse

Radio & Electronic Svce.
401 N. Townsend St. at Willow

Syracuse Communications, Inc.
2180 Erie Blvd. East
(CB & Ham Only)

Vestal

Compton Industries, Inc.
333 Vestal P'kway East

West Hempstead

Audotronic, Inc.
96 Hempstead Turnpike
(Hi-Fi & Test Equipt. Only)

NORTH CAROLINA

Charlotte

Tryon Repair Service
3125 Tuckaseegee Rd.

Raleigh

Speed Instrument Co.
3028 E. Rothgeb Dr.

OHIO

Cleveland

Electronic Instrument Labs. Corp.
3617 Detroit Ave.
(Instr. & Test Eqpt. Only)

Dayton

Audio Labs.
3470 Salem Avenue

East Cleveland

Whitlow Electronic Corp.
2150 Noble Road

Toledo

Don's Electronics
1682 Belmont Ave.
(Hi-Fi & Tape Recorders Only)

OREGON

Portland

Mote's Communications
2927 S. E. 21st Ave.
(CB & Ham Only)

PENNSYLVANIA

Harrisburg

H. L. Crossley
549 S. 19th Street
(CB & Ham Only)

Havertown

Michael's TV & Radio Service
1127 West Chester Pike

Philadelphia

Electronic Servicenter
13 S. 21st St.

Sunshine Scientific Inst.
1810 Grant Ave.
(Inst. & Test Eqpt. Only)

Transistor Eqpt. Service Ctr.
2212 Glendale St.

Woodlyn
(Suburban Philadelphia)

Altron Electronics Co.
1309 Jefferson Ave.

PENNSYLVANIA (continued)

Pittsburgh

John's Radio & TV Svce.
917 Freeland Street

RHODE ISLAND

Pawtucket

Unique Radio Co.
736 Central Ave.

SOUTH CAROLINA

Charleston Heights

Custom Audio Lab.
2202 Meeting St.
(Hi-Fi & CB Only)

Greenville

Cantrell Whlsl. Prod., Inc.
2570 N. Pleasantburg Dr.
(CB Only)

TENNESSEE

Chattanooga

Edwin Bohr/Electronics
5880 Dayton Blvd.
(Instr. & Test Eqpt. Only)

TEXAS

El Paso

Test Equipment Co.
5319 Harlan Dr.

Ft. Worth

Knight's TV & Audio
1127 S. Main

La Feria

La Feria Radio & TV Service

Lubbock

Edwards Communications Svce., Inc.
1821 Avenue M
(CB Only)

Texas City

Ham's Communication Svce.
3001 Somerset Ave.

UTAH

Bountiful

Anderton Electronic Lab.
129 E. 1800 South

Provo

Brickey Electronics
1408 North 1750 West

Salt Lake City

Radio Electronics TV Svce.
1876 E. 2990 South

VIRGINIA

Arlington

Washington Electronic Service Co.
4112 Wilson Blvd.

Hampton

Central Electronics
4327 Kecoughtan Rd.

Virginia Beach

Hi-Fi Clinic
242 First Colonial Rd.

WASHINGTON

Seattle

Ron Merritt Co.
1320 Prospect St.

CANADA

Toronto, Ontario

John R. Tilton, Ltd.
51 McCormack St.

Weston, Ontario

EICO Canada, Ltd.
20 Millwick Drive

EICO
Service Policy

PARTS REPLACEMENT

If it appears that a component is defective, and you desire a replacement, contact your EICO Distributor, the nearest EICO Authorized Service Agency or our Customer Service Department.

If you are claiming the right to a no-charge replacement under the terms and conditions of the warranty, it is required that you shall have sent in the registration card within 10 days of the date of purchase, and that you send back the defective part transportation prepaid. In claiming warranty service or parts, please send or show your original sales slip plus the IBM card from the carton. EICO or its authorized agency will make the necessary replacement at no charge for parts eligible under the terms and conditions of the warranty. In returning tubes, pack them very carefully to avoid breakage in shipment. Broken tubes will not be replaced. Please read the warranty on the subject of parts eligible for replacement.

Further information required on a part returned for a no-charge replacement under the terms and conditions of the warranty is as follows:

a) Model number and serial number, if any, of unit. Also any code numbers in red under the words INSTRUCTION MANUAL on the cover of the book supplied with the unit or Revision number, such as Rev. 1, Rev. 2, etc.

b) Stock number and description of part as given

In all cases, the unit must be sent to the factory or service agency transportation prepaid, and the unit will be returned to the customer transportation collect.

On kits, the services rendered for the minimum labor and handling fee by the factory are the correction of any minor wiring errors (not extensive corrections or rewiring), the labor involved in replacing defective parts, and any adjustments, alignment, or calibration procedures that would normally be performed on a factory-wired unit. Units not wired according to instructions, or modified in any way, or showing evidence of the use of acid core solder, will not be serviced and will be returned to the customer forthwith.

SEE SCHEDULE OF FACTORY SERVICE CHARGES

Units requiring extensive corrections or rewiring will incur an additional labor charge. An advance estimate will be submitted.

Please note: minimum labor and handling fees and service charges are subject to revision at any time.

LOCAL REPAIR FACILITIES

A list of authorized service stations is provided with your manual. The roster of stations may change from time to time, and if considerable time has elapsed since you purchased your unit, you are advised